

# *Greenspirit*

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**Submission**

**Of**

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**To**

**House Appropriations Committee  
Energy and Water Development Subcommittee**

**Room 2359, Rayburn Building  
Washington, DC**

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## **Introduction**

Mr. Chairman and members of the Subcommittee, thank you for inviting me here today to testify about why nuclear energy is so important to the energy future of the United States.

Specifically, you've asked me to give you my thoughts the future of nuclear energy in this country, and the extent to which interim storage may be needed in the near term, and spent fuel recycling in the long term, to support the growth of nuclear energy.

It's an important topic, and a very positive one, from the perspective of the planet's environmental health.

But before I move to the questions we've been asked to consider, let me first say a few words about who I am and where I've come from.

## **Co-Founding of Greenpeace**

In short, my story involves having been born in the tiny fishing and logging village of Winter Harbor, British Columbia on the northwest tip of Vancouver Island, through to my studies of the life sciences at the University of British Columbia, to my transformation to environmental activism in 1970 when a handful of us found ourselves in a Vancouver church basement planning a protest campaign against US hydrogen bomb testing in Alaska – that was the birth of Greenpeace.

I've been in the international environmental field ever since – as a founding member of Greenpeace, having served for nine years as President of Greenpeace Canada and seven years as a Director of Greenpeace International, during which time Greenpeace became the world's largest environmental activist organization.

## **From Confrontation to Consensus**

But by the mid-1980s Greenpeace had grown from that church basement into an organization with an income of over US\$100 million per year, offices in 21 countries and over 100 campaigns around the world. We had won over a majority of the public in the industrialized democracies. Presidents and prime ministers were talking about the environment on a daily basis.

I left the organization in 1986 because for me it was time to make a change. I had been against at least three or four things every day of my life for 15 years; I decided I'd like to be in favor of something for a change.

## **The Changing View of Nuclear Energy**

In the early 1970s, I believed that nuclear energy was synonymous with nuclear holocaust, as did most of my Greenpeace compatriots.

That's the conviction that inspired Greenpeace's first voyage across the North Pacific coast to protest the testing of U.S. hydrogen bombs in Alaska's Aleutian Islands.

But a lot has changed in the 35 years since then, and my views have changed along with these new circumstances.

As a co-chair of the Clean and Safe Energy Coalition along with Gov. Christy Todd Whitman, I make it known often that I strongly believe the rest of the environmental movement needs to update its views, too, because now -- more than ever before -- nuclear energy is the electricity source that can save our planet from another possible disaster: potentially harmful climate change.

## **Nuclear Energy can Reduce US GHG Emissions and Other Pollutants**

More than 600 coal-fired electric plants in the United States produce 36 percent of U.S. emissions (the same as 300 million automobiles) -- or eight percent of global emissions -- of CO<sub>2</sub>, the primary greenhouse gas responsible for climate change.

But I wish to be very clear on a corollary point: This country needs energy. Residential, institutional and industrial energy use -- and the activities supported by that energy use -- underpin the economy. I simply say that growth of the US energy portfolio can be both clean and safe.

Nuclear energy is the only large-scale, cost-effective energy source that can reduce CO<sub>2</sub> emissions while continuing to satisfy a growing demand for power -- *cleanly AND safely*.

## **The answer is Right in Front of Us**

I don't want to underestimate the very real dangers of nuclear technology in the hands of rogue states. But we should NOT ban the beneficial uses of a technology just because it can be used for evil. That was the all-or-nothing mentality at the height of the Cold War, when anything nuclear seemed to spell doom for humanity and the environment.

In 1979, Jane Fonda and Jack Lemmon took home Oscars for their starring roles in 'The China Syndrome,' a fictional evocation of nuclear disaster in which a reactor meltdown threatens a city's survival. Less than two weeks after the blockbuster film opened, a reactor core meltdown at Pennsylvania's Three Mile Island nuclear power plant sent shivers of very real anguish throughout your country and mine.

What nobody noticed at the time was that Three Mile Island was in fact a success story: The concrete containment structure did just what it was designed to do—prevent radiation from escaping into the environment. And although the reactor itself was crippled, there was no injury or death among nuclear workers or nearby residents.

Three Mile Island was the only serious accident in the history of nuclear energy generation in the United States.

Thirty years on, we have finally realized nuclear energy is a clean, safe and crucial electricity source, and we find ourselves in the midst of a nuclear renaissance.

### **Environmentalists Support Nuclear Energy**

There's no doubt that times have changed – and so has my thinking. And I should point out I am not alone among seasoned environmental activists in looking at this subject differently.

British atmospheric scientist James Lovelock, father of the Gaia theory, believes that nuclear energy is the only way to avoid potentially catastrophic impacts of climate change.

Stewart Brand, founder of the “Whole Earth Catalog,” says the environmental movement must embrace nuclear energy to wean ourselves from fossil fuels.

On occasion, such opinions have been met with excommunication by the anti-nuclear priesthood: The late British Bishop Hugh Montefiore, founder and director of Friends of the Earth, was forced to resign from the group's board after he wrote a pro-nuclear article in a church newsletter.

### **A Worldwide Nuclear Renaissance**

Let's look at the situation today: Because of changing circumstances -- the warming climate and the increasing costs and geopolitical uncertainties of fossil fuels – we see nuclear energy undergoing a global renaissance.

Countries around the world are re-examining the nuclear energy option.

More than ever, these countries are seeing that nuclear energy makes economic and environmental sense.

According to the World Nuclear Association, nuclear power capacity is increasing steadily worldwide, with about 30 new reactors under construction in 12 countries. Additionally, nuclear energy capacity is being increased through plant upgrades and plant life extension programs.

In Europe, Finland, France and the Slovak Republic are building new nuclear plants.

A new poll shows a majority of Swedes support nuclear energy and favor building new nuclear energy plants.

The new German administration is reconsidering the previous government's phase-out of nuclear energy, recognizing the hypocrisy of phasing out domestic nuclear energy plants while still importing 18.8 billion kWh/yr from France, which is 80 percent nuclear.

Earlier this year the Dutch government indicated that a second nuclear power plant in that nation was now a realistic option.

In Russia, there are five reactors under construction and due for completion by 2012. An additional 20 reactors are in the planning stages.

Poland's government has approved plans for construction of a 2,000 MWe nuclear plant, with construction to begin by 2010 and operation in 2015. Other plants are likely to follow.

South Africa has made a commitment to invest in new nuclear energy technologies, including high-temperature modular pebble bed reactors for both domestic and export use.

In Canada, the province of Ontario made the decision to build new nuclear power plants. This will allow the province to meet its energy needs, while fulfilling a long-standing promise to phase out fossil-fuel-powered plants in the province.

Mexico, Brazil and Argentina have nuclear power plants in operation, and Brazil and Argentina recently signed a "Joint Statement on Nuclear Policy" to increase cross border cooperation and integration of their nuclear energy, nuclear medicine and research programs.

Japan, South Korea, China and India are all committed to nuclear energy, and nuclear energy already plays a major role in these countries.

Japan has one new reactor under construction and construction of a second is to begin soon, with plans for 11 additional reactors totaling some 13,000 MWe.

South Korea plans to bring an additional eight reactors into operation by 2015, with total new capacity of 9,200 MWe.

China has ten operating reactors, with construction of the second of two Russian-made reactors soon to be complete in the Lianyungang region. Four Chinese-made reactors are also under construction while four larger reactors are also due to be constructed shortly. The Chinese aim to quadruple their nuclear energy capacity by 2020.

In Taiwan, Taipower is building two new, advanced reactors.

India now has seven reactors under construction with completion scheduled for 2010.

Other countries including Pakistan, Turkey, Indonesia and Vietnam are entering the nuclear energy field.

### **Playing a Leadership Role**

Why am I giving you this long list of recent global developments regarding nuclear power?

Because of this: As more and more countries begin adopting nuclear energy technology, I strongly believe the United States must take a leadership role.

There are currently proposals for over 20 new reactors in the US. Starting in 2007, applications will be made for the first combined operating and construction licenses in the country. If America is to secure its energy future, such proposals must be strongly encouraged.

The world looks to America for leadership on many issues, and I say the nuclear energy renaissance presents a key opportunity for the United States to take the lead in the design and development of sustainable nuclear energy technology.

### **Nuclear Energy Does Not Equate with Nuclear Proliferation**

That's not to say there aren't concerns— some based on myths—associated with nuclear energy. Each concern deserves careful consideration:

*Concern: Nuclear energy is expensive.*

*Fact:* It is in fact one of the least expensive energy sources. In 2004, the average cost of producing nuclear energy in the United States was less than two cents per kilowatt-hour, comparable with coal and hydroelectric. Advances in technology will bring the cost down further in the future.

*Concern: Nuclear plants are not safe.*

*Fact:* Although Three Mile Island was a success story, as I've already said, the accident at Chernobyl in 1986 was not. But Chernobyl was an accident waiting to happen. This early model of Soviet reactor had no containment vessel, was an inherently bad design and its operators literally blew it up.

The multi-agency U.N. Chernobyl Forum reported last year that 56 deaths could be directly attributed to the accident, most of those from radiation or burns suffered while

fighting the fire. Tragic as those deaths were, they pale in comparison to the more than 5,000 coal-mining deaths that occur worldwide every year. No one has died of a radiation-related accident in the history of the U.S. civilian nuclear reactor program. (And although hundreds of uranium mine workers did die from radiation exposure underground in the early years of that industry, that problem was long ago corrected.)

*Concern: Nuclear waste will be dangerous for thousands of years.*

*Fact:* Within 40 years, used fuel has less than one-thousandth the radioactivity it had when it was removed from the reactor. And it is incorrect to call it waste, because 95 percent of the potential energy is still contained in the used fuel after the first cycle. Now that the US has removed the ban on recycling used fuel under its research program as part of the Global Nuclear Energy Partnership (GNEP), it will be possible to use that energy and to greatly reduce the amount of used fuel that needs treatment and disposal. Last month, Japan joined France, Britain and Russia in the nuclear-fuel-recycling business. The United States will not – and should not - be far behind.

*Concern: Nuclear reactors are vulnerable to terrorist attack.*

*Fact:* The five-foot-thick reinforced concrete containment vessel protects the contents from the outside as well as the inside. And even if a jumbo jet did crash into a reactor and breach the containment, the reactor would not explode. Beyond that, the US nuclear power industry has taken many measures to protect against attack – from increasing its paramilitary security forces to a total of 8,000 officers on its 64 plants, to enhanced coordination with state and local law enforcement, intelligence resources and the military.

*Concern: Nuclear fuel can be diverted to make nuclear weapons.*

*Fact:* Nuclear energy development will not lead to more nuclear weapons for one simple reason: Countries no longer need a nuclear reactor to produce the enriched uranium for a nuclear bomb. Enriched uranium can be through new centrifuge technology, which does not require a nuclear reactor.

Over the past 20 years, one of the simplest and most important tools for farmers in developing countries—the machete—has been used to kill more than a million people in Africa, far more than were killed in the Hiroshima and Nagasaki nuclear bombings combined.

What are car bombs made of? Diesel oil, fertilizer and cars. If we banned everything that can be used to kill people, we would never have harnessed fire.

## **Ensuring Nuclear Non-Proliferation**

The only practical approach to the issue of nuclear weapons proliferation is to put it higher on the international agenda and to use diplomacy and, where necessary, force to prevent countries or terrorists from using nuclear materials for destructive ends.

And new technologies such as the reprocessing system recently introduced in Japan (in which the plutonium is never separated from the uranium) can make it much more difficult for terrorists or rogue states to use civilian materials to manufacture weapons.

The President's *Global Initiative to Combat Nuclear Terrorism*, signed with Russian President Putin in July is an important measure to safeguard nuclear technology and fissile materials to ensure they do not get into the wrong hands.

This latest agreement builds on existing multilateral arrangements such as the *G-8 Global Partnership Against the Spread of Weapons of Mass Destruction*. That agreement was launched to seek additional resources and partners for nonproliferation, disarmament, counter-proliferation and nuclear safety projects in Russia and other former Soviet states.

To date, partnership donors have pledged \$17 billion toward the \$20 billion target.

Bilateral and multilateral agreements, combined with new technologies, will go a long way to ensuring nuclear non-proliferation.

### **Nuclear Energy is Safe**

I've tried to place Three Mile Island and Chernobyl in some context. Today, approximately one-third of the cost of a nuclear reactor is dedicated to safety systems and infrastructure.

Personnel at nuclear power plants in the United States ensure safety according to four key steps:

- extensive government regulations have been established to protect the public,
- nuclear plants are built according to designs that meet the regulations,
- owners are required to operate the plants according to approved specifications and abide by strict controls on changing the designs, and
- regulators monitor operations and compliance with regulations through resident inspectors stationed at every site.

Equally important, nuclear energy can often be the driver behind a whole range of beneficial uses, including medical diagnosis and treatment, and electricity – both cornerstones of safety.

### **Fuel Recycling for the Long Term**

According to the World Nuclear Association, more than 90,000 tonnes of used fuel from commercial power reactors has been reprocessed for uranium & plutonium recovery, and annual capacity is now almost 5000 tonnes per year.

Recently, Japan joined France, Britain and Russia in the nuclear-fuel-recycling business.

The United States must stay abreast of this key development. I believe fuel recycling is the future for nuclear energy in America.

### **Recycling and Storage**

The Global Nuclear Energy Partnership (GNEP) will make it possible to use recycled fuel and therefore to reduce greatly the amount of waste that needs treatment and disposal.

While the GNEP research initiative goes forward and, subject to the results of that research, recycling programs are developed, it will be necessary to store spent fuel at regional centers or, where it makes sense, on-site in dry cask storage facilities.

But no matter which nuclear fuel cycle options the federal government pursues under GNEP, America will still need a deep geological repository in any case, simply because some radioactive byproducts will require disposal after recycling. So a combination of multiple regional centers for used fuel storage and a single, large storage facility such as Yucca Mountain will ensure US leadership in this important field.

### **Nuclear Energy is America's Future**

President Bush, with bipartisan support from Congress, should be congratulated for having recognized the long-term potential for nuclear energy to meet worldwide demand for electricity without producing emissions of greenhouse gases or air pollutants.

As a lifelong environmental activist – a former leader of Greenpeace who finds himself critical of some of their current energy policy – I am heartened that the administration recognizes the need for a long-term technology road map for nuclear energy, including the GNEP initiative

The 103 nuclear plants operating in the United States effectively avoid the release of 700 million tons of CO<sub>2</sub> emissions annually -- the equivalent of the exhaust from more than 100 million automobiles.

In order to meet our energy needs going forward, and to do so in an environmentally responsible manner, we must mobilize all the clean energy sources available. Every responsible environmentalist should support a move in the direction of nuclear energy generation.

The time for common sense, for scientifically-sound decisions on energy and for support nuclear power generation is here and now.

Thank you.